

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION FOR U.S. LETTERS PATENT

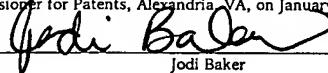
**TITLE: DEMOUNTABLE TIRE RIM WITH A SPARE INNER WHEEL
AND TIRE FOR SAID TIRE RIM**

Inventor: José Santiago Rolla

Attorney:
Paul L. Brown, Esq.
Reg. No. 27,184

Correspondence Address:
EMRICH & DITHMAR
Suite 3000
300 South Wacker Drive
Chicago, IL 60606
Telephone 312/663-9800
Facsimile 312/663-9822
Case No. 114

I hereby certify that this correspondence is being deposited with the U.S. Postal Service as Express Mail No. EV216614483US addressed to Mail Stop Patent Application, P.O. Box 1450 postage prepaid, before the last scheduled pick-up to Commissioner for Patents, Alexandria, VA, on January 5, 2004.


Jodi Baker

I – Background of the invention

Field of invention.

The present invention relates to a tire rim which allows a vehicle to run with a flat tire. More particularly, it relates to a **demountable tire rim with a spare inner wheel and tire for said tire rim** which two main parts can be easily disassembled to place or remove the spare inner wheel that is placed into the wheel.

Description of prior art.

Within the prior art, there is US Patent 2105317 which discloses an aircraft wheel made of two pieces. However, this tire rim is not apt to be used in automobiles and in addition, it is not prepared to carry a spare inner wheel inside.

US Patent 3037815 shows a wheel in which the tire rim has a thread to vary the tread . This wheel is intended to be used in tractors and lacks the spare inner wheel.

US Patent 4989657 is a modular wheel consisting of two main pieces and a third piece to ensure the tire grip. These pieces are joined by means of bolts but they lack other coupling means. It is not prepared for the assembly of a spare inner wheel, either.

US Patent 5022450 discloses a set of safety tire rim and demountable wheel. Both parts of the tire rim are joined by means of bolts and lack other coupling means. There is an insert to run with the flat tire which is simply added but does not determine the tire rim structure.

None of these well-known tire rims is prepared to have a spare wheel and at the same time, be demountable with threaded or bayonet type coupling

1- means.

2- II – Summary of the invention

3- The present demountable tire rim with spare inner wheel comprises two
4- complementary annular parts provided with threaded reciprocal coupling
5- means. Both complementary annular parts form side holding edges for the
6- tire beads and in the central part, they form the assembly for one or more
7- spare wheels.

8- Objects and Advantages.

9- An advantage of the present tire rim is that it allows to place and easily re-
10- move the spare inner wheel.

11- Another advantage is that it simplifies the placement and removal of
12- tubeless tires which are easily performed and there is no need of using levers
13- as it usually occurs with one-piece tire rims. This is very significant in low
14- profile tires in which due to the height of their lateral walls, these ones are
15- less flexible making manipulation in conventional tire rims difficult.

16- A further advantage of the present tire rim is that it is provided with as-
17- sembly means like an annular depression wherein the spare inner wheel
18- wedges and slides which allows to run with tubeless tires without them be-
19- ing deteriorated. All the well-known similar systems, although having their
20- contact surfaces lubricated, do not have an annular depression for the spare
21- wheel to be slided relative to the tire rim. Therefore, contact between the
22- spare inner wheel and the tire causes its deterioration because the difference
23- in diameters causes a destructive attrition between both of them.

24- In addition, the present tire rim is compatible with different antifriction
25- means such as rollers at the base of the inner wheel or burnishings or anti-

1- friction coatings in the assembly means of said inner wheel. All this, on the
2- one hand, facilitates the relative sliding between the inner wheel and the tire
3- rim, and on the other hand, contact between the inner wheel and the tire,
4- thus avoiding deterioration of the tire.

5- The present tire rim is compatible with the use of inner wheels made of
6- different materials, namely plastic, thermoplastic, elastomer, flexible, semi-
7- flexible, semirigid or rigid. The use of these materials and the chance of in-
8- corporating easier holes allow the inner wheel to be resistant and at the same
9- time, light and safe.

10- This tire rim is also compatible with the use of spare inner wheels, either
11- one- piece or not, for instance, consisting of three or more sectors connected
12- to one another through flexible and strong bonding elements, which allow
13- them to behave like one-piece wheels and allow them to be warped, lessen-
14- ing their major diameter so as to be placed and removed from the inside of
15- the tire which inner mouth has a shorter diameter.

16- Yet a further advantage of the present tire rim is high safety. This is due
17- to the fact that it is provided to complement threaded or bayonet type re-
18- ciprocal coupling means with a plurality of connection passages wherein
19- bolts with nut, lockpins, annular groove with cross section washer, etc. are
20- arranged.

21- A yet further advantage is that the present tire rim allows to form an
22- aerodynamic and aesthetic wheel and its conformation allows it to adapt to
23- measurements standardized by international regulations which govern the art.
24- And the modified tire is intended to decrease friction with the inner wheel,
25- determine a guided movement on it and decrease rotating displacement

1- with reference to the tire rim upon running under flat condition.

2- III – Detailed description

3- As it can be observed in figures 1 and 2, the present invention is related to a
4- demountable tire rim (1) with spare inner wheel (3) which is integrated by
5- two complementary annular parts (4)(5) provided with threaded reciprocal
6- coupling means (10).

7- The body of the demountable tire rim (1) comprises two complementary
8- annular parts (4)(5) which consist of a first part (4) and a second part (5). Both
9- complementary annular parts (4) (5) are provided with each side holding rims
10- (6) (13) for the tire (2).

11- According to figure 7A, between the holding rim (6) or (13) and an adja-
12- cent rim (7a) a wedge is formed (7) for the tire (2) bead (51). The possibility
13- that the adjacent rim (7a) has gearing means (43) with similar means (53)
14- provided by the tire (2) bead (51) has been provided; this allows an integral
15- assembly between the tire rim (1) and the tire (2) (See figure 7b).

16- In the central part of the tire rim (1) there are assembly means for one or
17- more spare wheels (3). These assembly means comprise a central depression
18- (9). That may be even or grooved (17) limited by side edges (8) (12) and
19- central rims (15) which are supported against said side edges (8) (12). When
20- there are two or more spare wheels (3), separating rims (16) can be added
21- (16). (See figures 1, 2, 4, 5 and 6).

22- The two complementary annular parts (4) (5) have reciprocal coupling
23- means based on threads (10). (See figures 1 and 2). In one case, the recipro-
24- cal coupling means consist of each continuous threads (10) formed at the
25- above mentioned complementary annular parts (4) (5). In another case, the

1- reciprocal coupling means consist of a plurality of threaded sectors (40) on
2- the edge of the whole perimeter of both adjacent segments of the tire rim (1)
3- which have, on one of their ends, an elevated part as a stop (41), inserted
4- with sectors without thread (42), which surface is at a lower level in relation
5- to the threaded sectors (40), these ones being different sectors, of the same
6- width, so that they can be inserted to one another, to be fixed by means of
7- threading spindrift movements. (See figures 25A, 25B and 25C).

8- The reciprocal coupling means are complemented by means of intercon-
9- nection and fixation means (19) of the complementary annular parts (4)(5).
10- These interconnection and fixation means (19) comprise a plurality of equal
11- and equally-spacedly openings distributed on flanges placed on the perime-
12- ter of both edges, which, one opposite the other form passages for fixation
13- screws or for bolts with lockpin washer (See detail in figure 1 and figure 2).

14- In figures 1, 4, 5 and 6, it can be seen that both complementary annular
15- parts (4)(5) define a joint area (11) that may be even or with annular ledges.
16- The annular ledges can be facing or insertable. In this joint area, there is an
17- elastomeric joint (14) that may also be even or with annular ledges.

18- Concerning the spare wheel (3), it can be grooved (23)(24)(25) or even (22)
19- in one- piece, one- piece with recesses (29) on the even periphery (22), one-
20- piece with recesses (30) on the inner edge (23) or either comprised by sectors
21- related to an annular member which goes through them.

22- Different examples of spare wheels (3) are illustrated in figures 7, 8, 9, 10,
23- 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23 and 24.

24- With regard to the tire, in addition to the gearing means (53), it possesses
25- a reinforcement annular member (52) arranged within the bead (51) (See fig-

ures 3 and 7B).

In Figures 1 and 2, some inner ledges (50) of the above mentioned tire (2) can be seen to face and facilitate contact with the spare wheel (3) under flat tire running conditions.

It is evident that when the present invention is put into practice, modifications may be made regarding certain construction and shape details, without departing from the basic principles which are clearly encompassed in the following claims.
